Run2b Workshop

Morning Agenda

- 10:00   Overview and Goals of this Workshop   J. Incandela, FNAL

Accelerator

- 10:10   Run 2a and Run 2b beam conditions   M.Martens, FNAL

Run 2a

- 10:45   Lifetime of Silicon   S. Worm, New Mexico
- 11:10   Radiation issues for DOIMs, CPC's   Y. Gotra, Pittsburgh
- 11:25   Tracker Performance Capability   A. Yagil, FNAL
- 11:40   Material & Effects on Tracking   D. Stuart, FNAL
- 12:00-1:00   Lunch

Run2b Workshop

Afternoon Agenda: Run 2b

Sensor Replacement Technologies

- 1:00   Rad Hard Silicon R&D   N. Bacchetta, INFN Padova
- 1:25   Pixels   W. Wester, FNAL
- 1:50   Diamonds   J. Conway, Rutgers

Electronics and DAQ

- 2:10   Deep sub-μm: rad-hardness N. Bacchetta, INFN Padova
- 2:40   Deep sub-μm: SVX3 issues   O. Milgrome, LBNL
- 3:15   Front-end/DAQ issues   W. Wester, FNAL
- 3:30   Hybrid Technologies   C. Haber, LBNL
- 3:45   Coffee Break

- 4:00   Working Group Organization & Discussions
- 5:30   Wrap-up: plans for convergence

Overview and Goals

- Run 2 will be appreciated, (even by Fermilab management and the DOE), as a major opportunity
  - We must prepare to run and acquire high quality data until LHC experiments start really publishing physics
    - 2006, 2007, 2008 ?
  - We must maximize run time and lifetime
    - minimum shutdowns of ≤ 6 month each ?
    - ≥ 30 fb^{-1} , luminosity of 10^{33} ?
  - We need a strategy that
    - optimizes physics
    - doesn't paint us into a corner
    - is achievable at
      - reasonable cost
      - minimal schedule risk
   - no loss, and possibly some improvement, in performance
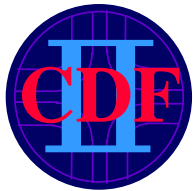
First Steps

- ## This workshop
  - Summarize the important things we know about the Run 2a detector and beam conditions for all of Run 2.
  - Start addressing the most critical issues for Run 2b Si replacement.
  - Form working groups to address remaining important questions

- ## Tentative plan
  - All speakers presenting today will provide electronic (Latex preferred) succinct summaries of their talks and related discussions. The proceedings of the workshop will be compiled into a CDF note.
  - Working groups will choose leaders and address a list of critical issues either in subsequent meetings or by e-mail. We will then reconvene within a month to hear reports from all working groups.
  - We will try to converge on a single consensus option and then follow this with a proposal. If no single option is agreed upon, then I expect several proposals could appear.
  - Again, we will turn the proceedings into a CDF note.

Desired Outcomes

- Bring together all relevant information and make it widely accessible (1st CDF Note)

- Address tougher questions and better understand our Run 2b options. Make recommendation(s) if a consensus can be formed (2nd CDF Note)

- Follow through with proposal(s)
  - based on the right goals
  - taking into account the right resource expectations
  - detailing projects with very high probability of success
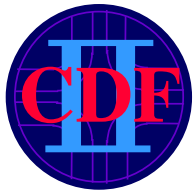
Working Groups

- ## Tentative list of groups
  - ### Sensor technologies
    - micro-strips, pixels, diamonds
  - ### FE/DAQ
    - chips, hybrids, other readout components and DAQ
      - what chip options, hybrid designs, what to do about other components and what is the impact on the existing DAQ
  - ### Geometry
    - Layout for physics
      - acceptance, number of layers, stereo angles, material budget, track parameter resolutions, pattern recognition issues
  - ### Accelerator
    - what peak luminosities, what total integrated luminosities, what luminous region size ?
    - What do we need, how can it be achieved ?

Working Groups (2)

- Questions/Tasks (note in any particular order)
  - <u>Overview</u> of issues
  - <u>Technical</u> issues/risk
  - <u>Manpower</u>/expertise: needs/availability
  - <u>Equipment & space</u> requirements
  - <u>Schedule</u>
    - with contingency for greater than 90% success probability
  - <u>Cost</u> estimates
    - with significant contingency
- This should result in a careful analysis of pros and cons
  - physics performance - tracking
  - lifetime
  - shutdown/downtime minimization
  - cost and schedule
  - ease of access, how easily replaced ?

Rough Guidelines

- **First stab at guidelines & specifications**
    - Material < 10% X_o for SVXII/L00 replacement (the less the better)
    - At least as good acceptance and hit information as in Run 2a
    - At least as good track parameter resolution " "
    - Similar or more simple pattern recognition " "
    - Maximum 5M$ total cost
    - $\leq$ 6 month shutdowns every ~10 fb^{-1} or more
    - Simple construction, robust technologies and methods